

- | | | | |
|---|--|----|--|
| 2 | Is it necessary to restrain corrugated pipe? | 8 | Microtechnology: Upgrading |
| 4 | Iowa's roadside prairies | 10 | Don't miss Iowa's Winter Training Expo—coming in October |
| 5 | New faces at CTRE | 10 | Name that tune |
| 6 | On the trail of alternative travel | 11 | New publications and videos |
| 6 | Funding for trails | 12 | Conference calendar |

Light pole installation made safer and easier

Jay Shepard, an electrician for the Iowa Department of Transportation, combines his initiative with an innovation to make his crew's jobs safer.



GRAPPLING with a 55-foot galvanized steel highway light pole to set it in an upright position can be a difficult and dangerous task. Add some rain, snow, or ice and this process can seem impossible.

Jay Shepard, an electrician for the Iowa Department of Transportation (Iowa DOT), has discovered a handy device that makes the process easier: a pole stabilizer, which attaches to the pole with a strap binder. The stabilizer makes the pole more manageable, allowing Shepard to quickly and easily set the pole on its base.

Will Zitterich, director of maintenance services for the Iowa DOT, says worker safety is the most important consideration in highway light pole installation. Since light poles sit alongside the roadway, installers are exposed to traffic. Zitterich adds that workers may close one lane of traffic to accommodate installation, depending on the situation.

In a typical light pole installation procedure, workers use a high reach (aerial platform) with a guide rope to lift the pole to an upright position. One worker controls the movement of the high reach while another worker grasps the pole to guide it onto the base.

To secure the pole to the base, the guide worker must align bolt holes on the pole with bolts on the base. Zitterich says this is especially tricky because poles are becoming taller and heavier. A wet or icy pole that is hard to grip exacerbates the difficulty, and fast moving traffic nearby increases the danger.

Shepard's pole stabilizer is a steel tube that acts as a handle on the pole. While the high reach pulls the pole up, Shepard grasps the stabilizer and walks the pole forward to the base. Since the stabilizer provides better control, Shepard can more easily twist the pole and mount it onto the base.



An Iowa DOT employee guides a light pole into place with the pole stabilizer.

"If you set a couple of poles [using the pole stabilizer], you'll probably find you don't want to set poles without it," Zitterich says.

Shepard discovered a variation of the pole stabilizer several years ago while helping a crew install light poles in the Davenport area. Last year Shepard modified the device and started using it in the field.

The number of poles Shepard replaces each month depends on road conditions. During wet or icy driving conditions, he says, as many as 20 poles per weekend have been damaged in the Des Moines area.

Shepard fabricated his modified version of the pole stabilizer right in the DOT shop. Costs are minimal. Zitterich says if you have access to scrap steel, the only cost will be time spent on fabrication.

"I am pleased to see that an Iowa DOT employee noticed an improvement that makes his job more efficient and safe," Zitterich says. He encourages all employees to find methods to make their work easier and more enjoyable.

For more information on the pole stabilizer or its design specifications, contact Will Zitterich, 515-239-1396. ■

The preparation of this newsletter was financed through the Local Technical Assistance Program (LTAP). LTAP is a nationwide effort financed jointly in Iowa by the Federal Highway Administration and the Iowa Department of Transportation. Its purpose is to translate into understandable terms the latest state-of-the-art technologies in the areas of roads, bridges, and public transportation.

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TECHNOLOGY NEWS
nameplate was designed by
Jennifer Reed.
Special graphics designed by
Patricia Santiago.



Is it necessary to restrain corrugated metal pipe?



CORRUGATED METAL PIPE (CMP) culverts are an economical alternative to bridges. One problem in the use of CMP,

however, occurs when pore water pressure in the soil beneath the pipe causes the pipe to raise up. When this happens, the roadway over the pipe can fail. One way of preventing uplift is by using a tiedown or end restraint. The end of the pipe is sometimes secured in what looks like a concrete cradle.

Such tiedowns may be unnecessary, according to the results of an Iowa State University research report called *Design Methodology for Corrugated Metal Pipe Tiedowns: Phase II*. If tiedowns aren't used, what restraining force is needed to prevent the pipe from raising up? That was the question posed by Robert Lohnes, F. Wayne Klaiber, Bruce Kjartanson, Al Austin, and several graduate students from ISU's Civil and Construction Engineering Department.

The researchers have developed a flow chart and 24 design charts to determine the required restraining force for CMP. The charts are found in the report mentioned above, which may be borrowed from the library at the Center for Transportation Research and Education (CTRE). Except for the first two steps, this process is the same for new installations and retrofitting operations.

1) The first step for a new installation is to determine the required pipe length based on the site characteristics. These characteristics include the

elevation at the top of the roadway and flow line, the roadway width, and the foreslope angle. The engineer should also determine the soil type as glacial fill or clayey alluvium.

Generally .6 m (2 ft) soil cover for the CMP is required. Analyses with varying depths, however, have revealed that the soil cover is not critical in determining the required restraining force because the largest resistance to uplift occurs within the foreslope.

For retrofitting operations, the engineer needs to determine the same site characteristics as for a new installation, either by checking schematics or taking measurements at the site.

2) For new installations, the second step is to conduct a hydraulic design of the culvert to determine the pipe diameter and the appropriate gage of CMP based on the amount of water expected to flow through the CMP. For retrofit operations, check the design specifications.

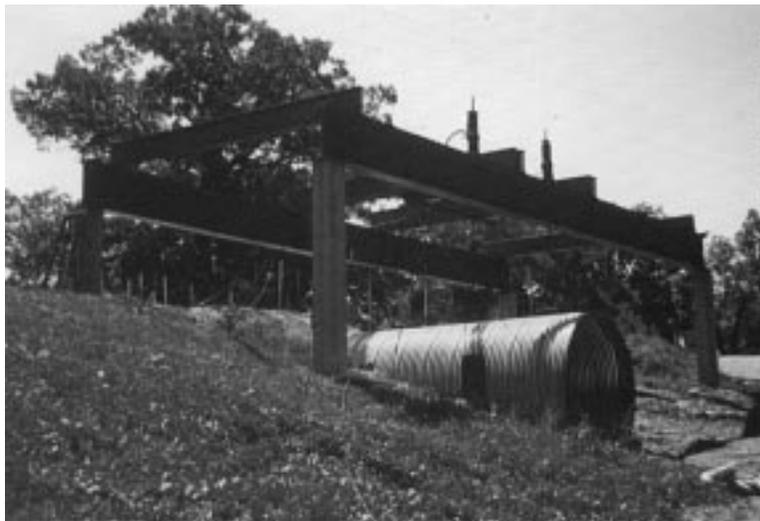
For the following steps, which apply to both retrofit and new installation, consult the design charts in the report to obtain specific answers to individual CMP construction situations.

3) After the hydraulic design is complete, the engineer determines the normal and the critical depths of flow through the CMP. The report describes the process needed to determine the normal depth of

flow and provides charts for determining critical depths of flow. The amount of restraining force required is reduced if higher depths of water are flowing through the pipe.

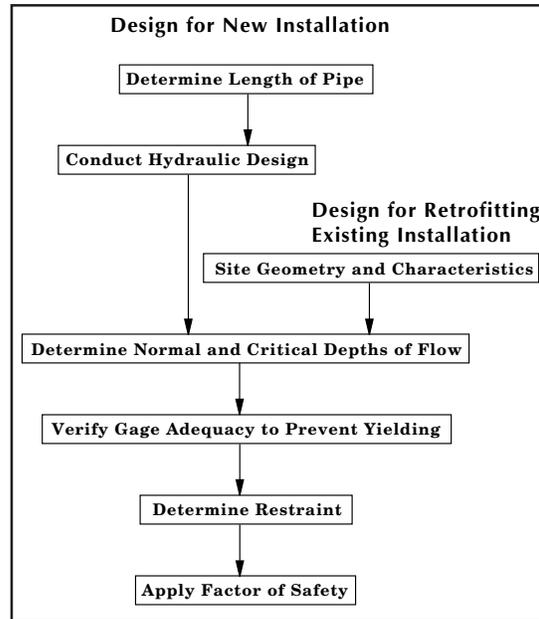
4) The fourth step is to make sure the CMP gage is adequate so it won't yield in bending.

5) Then based on the soil type and stiffness, the pipe gage, and the assumed flow conditions, the fifth step is to determine the required restraint by checking the appropriate design charts



Overall view of test frame and CMP test specimen.
Photos here and on page 3 courtesy of F. Wayne Klaiber.

Abbreviated flow chart showing the process for new CMP installations and retrofitting operations. A detailed description of the process is given in an ISU research report available through CTRE's library.



according to pipe gage and percent flow. In some situations no restraining force will be required.

6) The last step is to apply a safety factor. The engineer needs to use his or her judgment in each individual situation. For example, consider the assumed flow conditions. In the engineer's judgment, if the pipe will never be plugged, the safety factor should be less. Also consider the grade of the foreslope. As the slope angle decreases, the net uplift force increases. Finally, evaluate the economics and constructability of the project when considering safety.

The design process is based in part on five field tests on 2.43 m (8 ft) diameter CMP. Uplift forces were provided by hollow-core hydraulic cylinders through a system of cables and wide steel bands beneath the CMP. The various pipes were subjected to uplift with a variety of soil and foreslope conditions.

The first test was with a soil cover and a foreslope. The second and third experiments were without the soil cover; one experiment was with the uplift force provided by the front strap only and the other had force applied from both straps to evaluate the effect of different uplift forces. The fourth test was on a pipe covered with backfill but without the foreslope; the fifth was a pipe that had a concrete restraint at the inlet.

Researchers concluded that the presence of a foreslope had a significant effect on the CMP bending characteristics. Also the amount of water flowing through the pipe affected the required tiedown force. Tiedowns may not be required where the soil and/or the pipe is sufficiently stiff or where total blockage of the pipe is unlikely.

The ISU researchers suggest that various DOT agencies' requirements for the use of CMP may be conservative. Consequently these agencies may be overlooking the

expanded use of CMP by limiting their maximum diameter. Researchers also think the design process described above is easy to follow and allows the engineer to use his or her own judgment and experience.

This research was sponsored by the Iowa DOT (Highway Division) and the Iowa Highway Research Board (HR-362). To borrow *Design Methodology for Corrugated Metal Pipe Tiedowns: Phase II* (Final Report to Iowa DOT June 1995) from CTRE's library, contact Stan Ring, library coordinator, 515-294-9481. ■■



2:1 slope for test 8SC

LTAP Advisory Committee

The people listed below help guide and direct the policies and activities of the Center for Transportation Research and Education's Local Technical Assistance Program (LTAP).

The committee meets at least annually. Representatives of rural and urban agencies and individuals concerned with the transfer of transportation technology in Iowa are welcome to attend advisory committee meetings.

Contact any of the advisory committee members to comment, make suggestions, or ask questions about any aspect of LTAP.

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Center for Transportation
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IOWA STATE UNIVERSITY

Iowa's roadside prairies

This article is the first in a series on transportation and the environment in Iowa.



THE AESTHETICS OF PRAIRIES in right of ways are nice, but weed control is the “highest priority to me,” says Blake Deiber, Crawford County’s roadside vegetation manager. A weed, Deiber says, is a plant that’s out of place and has a negative economic impact on someone.

All weeds in rights of way that are on the state noxious weed list must be controlled by using chemicals, mowing, or biological methods. When a prairie is planted, weeds are smothered by other, more desirable plants. Counties feel the value of roadside prairies where it counts—in their budgets.

Cheaper, safer, prettier roadside treatment

Crawford County stumbled into its roadside prairie program in 1987. A farmer donated several acres of ground to the Conservation Reserve Program (CRP) with the requirement that the land be planted in prairie. Deiber says the ground was thick with weeds, but by the fourth year, they were smothered by prairie grasses. That shows how well a prairie controls weeds, Deiber says.

Since 1991, Deiber says, 750 acres of prairie have been planted in Crawford County’s 7,200 acres of right of way. By the third year of its Integrated Roadside Vegetation Management (IRVM) program, the county was no longer spraying the seeded areas.



Black-eyed susans bloom from June to October and grow up to three feet high. *Photo courtesy of the Iowa DOT, from its “Discover Iowa’s Roadside Flowering Plants and Grasses” brochure.*

Preparing a roadside for planting requires special equipment like this seed drill to keep seeds from blowing away. *Photo courtesy of Kirk Henderson, UNI’s Office of Integrated Roadside Vegetation Management.*



In 1989 Crawford County used 1,500 gallons of chemicals to control 700 miles of roadsides. In 1996 the county used just 300 gallons to control 1,200 miles of roadsides. Some of this decrease was due to “more timely spraying,” Deiber says, as well as to employees being better trained at identifying weeds and wildflowers, but the rest was due to the prairie.

Prairies are “reducing our cost,” Deiber says, which means savings for the county. Spraying cost \$43 per mile in 1996, which included depreciation for equipment, repair and maintenance of equipment, labor, and one-fourth the administration budget.

The overall cost of doing business for the roadside management program, including spraying, seeding, and prairie management, was \$140 per mile in 1996. That cost included all labor for seeding, spraying, and prairie management; all repair and maintenance of equipment, but not depreciation; and fuel, chemicals, and buildings.

Besides controlling weeds, prairies help increase roadside safety by maintaining safe sight distances at intersections. Deiber uses short grass mixes such as little bluestem and sideoats grama, which grow one to three feet tall. By using burn management on the prairies, Deiber says the amount of brush at intersections is also reduced.

People aren’t the only ones to benefit from prairies. Prairies also become habitat for wildlife.

Crawford County rebuilds about 25 miles of road per year, which means that Deiber’s roadside management team seeds 12 acres per mile with a prairie grass mix. The mix usually includes big bluestem, little bluestem, Indian grass, and sideoats grama. Wildflowers are mixed in for noticeable areas such as backslopes, intersections, and places not mowed.

The old adage “if it’s yellow, it’s a sunflower, and if it’s purple, it’s a thistle” no longer works to guide spraying for weeds. Examine plants carefully, Deiber says. By identifying plants like nodding ladies’ trusses, an orchid which used to be sprayed or mowed, Deiber says the county has learned not to spray these valuable plants.

A prairie is a “long-term community” that “will take care of itself” as long as it’s not disturbed, Deiber says. The hardest part is during a prairie’s first three or four years, its establishment phase.

PRAIRIES . . . continued on next page

New faces at CTRE

CTRE INTRODUCES three new staff members.



Michael Jorgensen is CTRE's new Safety Circuit Rider. He replaces Ed Bigelow, who retired last fall. Mike will continue and enrich CTRE's highly successful safety program by providing safety information and training to Iowa's cities and counties, including workshops in flagger training and accident location and analysis. He received a bachelor's degree in civil engineering from

South Dakota State University in 1986 and a master's degree in transportation engineering from Iowa State University in 1992. He was a traffic engineer with the Iowa Department of Transportation for six years and later with consulting firms in the Des Moines area for four years. Mike is a member of the Institute of Transportation Engineers, the Missouri Valley Section Institute of Transportation Engineers, and the Iowa Traffic Control and Safety Association.

Pam McColley is CTRE's first full-time network administrator. She maintains and updates CTRE's computers, computer networks, and software and provides general computer system support for CTRE staff. She advises the center's administration about the optimum hardware and software configurations for the



center's various computing needs—geographic information systems, computer-aided design, publishing, graphics, simulation models, World Wide Web activities, etc. Pam graduated from the National Education Center in Des Moines in 1990 with an associate degree in electronic engineering technology, and before joining CTRE she worked for APEX Systems.



Adrienne Lamberti joins CTRE's publishing group as a half-time communications specialist. Adrienne edits and publishes research reports, writes newsletter articles (see pages 6 and 7), and helps with the design, programming, and publishing of CTRE's World Wide Web site. Adrienne received a bachelor's degree in English with a minor in communications from Simpson College in 1994 and a master's degree in English from Iowa

State University in 1996. In addition to her work at CTRE, she teaches composition classes at Iowa State University and the Des Moines Area Community College and freelances as a Web page designer. ■■

PRAIRIES . . . continued from previous page

Getting started

Kirk Henderson, who manages the Office for Integrated Roadside Vegetation Management at the University of Northern Iowa, is the person to contact if you're interested in starting a program like Deiber's.

Henderson will provide specific details about vegetation management plans from other counties and will help counties develop their own plans. A 50-page guide to developing and implementing an IRVM program is just one of the many resources the IRVM office can provide.

Henderson says a county's first-year objectives for its IRVM program should include getting grant money from the Living Roadway Trust Fund (LRTF), which is coordinated through the Iowa Department of Transportation (DOT).

The LRTF has approximately \$500,000 per year to award in grants, says Steve Holland, the Iowa

DOT's roadside coordinator. Most grants range from \$5,000 to \$20,000. Holland says that counties do not need to hire roadside managers in order to qualify for these funds. Cities and private individuals may also apply.

Henderson will help counties prepare their grant applications. A county's first grant will pay for an inventory of the county's vegetation conditions, specialized equipment (usually a native grass drill), and prairie grass and wildflower seed for a demonstration planting.

With 600,000 acres of right of way in Iowa, Henderson says the IRVM office wants to "impress people with the importance of doing more with their roadsides."

For more information about starting an IRVM program in your county, contact Kirk Henderson, 319-273-2813. For information about grants from the LRTF, contact Steve Holland, 515-239-1768. ■■

On the trail of alternative travel

by Adrienne Lamberti



WHEN ROLLING DOWN the car window isn't enough for outdoors enthusiasts, bicycling and walking become popular travel options. Several cities have recognized this trend by establishing trails specially designed for alternative transportation. An innovative trail system in Hutchinson, Minnesota and another shared by Iowa cities Waterloo and Cedar Falls suggest not only the growing significance of two-wheel/footed transport, but what can happen when local, state, and international transportation agencies collaborate.

The Friendly City

In 1993 Hutchinson, defining itself as the "Bicycle and Pedestrian Friendly City," joined the

Minnesota Department of Transportation (Mn/DOT), the Federal Highway Administration (FHWA), and the Finnish National Road Administration (FinnRA) in creating a prototype of cooperation between vehicle and bicycle traffic. A brochure for the Hutchinson project defines its objective as "integrating transportation options and enhancing the quality of life in Minnesota communities." Rather than developing as a separate interest, the project conceptualizes bicycle and walking path development as an integral part of those transportation modes already established throughout the city.

While some car-loving Hutchinson residents are wary of the project, there is a "core of more high-tech, maybe younger residents who really want to bike," says John Rodeberg, director of engineering and public works. "Some of the response has been

TRAILS . . . continued on next page

Funding for trails

ISTEA funding

At least until the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 is reauthorized later this year, the following programs are possible sources of federal funds for trails.

National Highway System funds (Section 1006) may be used to construct bicycle transportation facilities and pedestrian walkways on land adjacent to any highway on the National Highway System (other than the Interstate System).

Surface Transportation Program (STP) funds (Section 1007) may be used for either the construction of bicycle transportation facilities and pedestrian walkways, or nonconstruction projects (such as brochures, public service announcements, and route maps) related to safe bicycle use. Ten percent of STP funds are used for "transportation enhancements" which include the provision of facilities for bicyclists and pedestrians.

Federal Lands Highway funds (Section 1032) may be used to construct pedestrian walkways and bicycle transportation facilities in conjunction with roads, highways, and parkways which access or pass through federal public lands.

Scenic Byways Program funds (Section 1047) may be used to construct facilities along scenic highways for the use of pedestrians and bicyclists.

National Recreational Trails fund (Section 1301) monies may be used for both motorized and nonmotorized trail projects, including those that benefits bicyclists and pedestrians. Projects must be consistent with a Statewide Comprehensive Outdoor Recreation Plan required by the Land and Water Conservation Fund Act.

Section 402 funding. Pedestrian and bicyclist safety remain priority areas for highway safety program funding. Title II, Section 2002, of the ISTEA addresses state and community highway safety grant program funds. The

priority status of safety programs for pedestrians and bicyclists expedites the approval process for these safety efforts.

Federal Transit funding (Section 25) continues to allow transit funds to be used for bicycle and pedestrian access to transit facilities, to provide shelters and parking facilities for bicycles in or around transit facilities, or to install racks or other equipment for transporting bicycles on transit vehicles.

Statewide Planning funds (Section 1025) funds allow local entities to apply for planning and design funding for the preparation of local or regional bicycle transportation and pedestrian walkway plans to be incorporated into the statewide long-range plan.

Bridge Access funds (Section 1033) allows, at a reasonable cost, for bridge deck replacement and rehabilitation projects to include accommodations for bicycles, except on controlled access roads. Bicycle and pedestrian accommodations are permitted as part of all new and replacement bridge funding.

State of Iowa funding

The state Recreational Trails Program allocates grants to sponsors of trail projects within Iowa. Eligibility criteria for these projects are that the projects must:

- be for public use
- be part of a local, areawide, regional, or statewide plan
- allow for the enjoyment of scenic views or points of historical interest

Sponsors must offer a minimum of 25 percent matching funds from a source that is not another state grant. The 1997 Iowa legislature increased this fund to \$2 million per year for two years beginning July 1, 1997.

Application deadlines are January 2 and July 1. Information and application forms can be obtained by writing Nancy Burns, Iowa DOT, 800 Lincoln Way, Ames, IA 50010, or calling 515-239-1621. ■

TRAILS . . . continued from previous page

skeptical, since it is a car-driven community, but there are some who really use their bikes to get to work. I'd say we also have as many in-line skaters as bikers."

Currently, on-street striping is being applied to benefit cyclists, and there is a public state trail through the town that crosses only one major road. Mn/DOT is also working in conjunction with the city to fund the connection of Hutchinson's trails to other parts of the state. A broad-based approach is being taken to generate community enthusiasm for the project.

"We've developed a strong program within the school system, for example," Rodeberg says. "The police do bike safety training within the school." Communicating safety awareness and education about alternative travel occurs via "education, enforcement, and construction."

In addition to this holistic perspective on transportation, the cooperation between international interests is a novel approach with this project. Mn/DOT, FHWA, and FinnRA's partnership was established in 1991 in the interests of sharing valuable research in transportation.

"We're coming up with some really great ideas and also seeing the differences between cultures," Rodeberg says. In Finland, for instance, bicycling "feeds into normal life. There isn't the same kind of public school transit system," thus prompting a greater use of mass transit and alternative transportation. Bicycling in Finland, for example, decreases by only 20 percent in the wintertime. Radically changing the attitude toward alternative transportation, however, is not the main priority for the Hutchinson project.

"We're not expecting instant miracles," Rodeberg says. "We really see this more as a generational issue; we're not out to change the world, but to slowly get this into the culture and promote safety awareness."

And further south

In the Iowa cities of Waterloo and Cedar Falls, the interest in trail systems has also caught on. The Waterloo/Cedar Falls system, consisting of 40 interconnected trail miles, will see its mileage nearly double in the next two years. Not only does the trail development involve several partners on federal, state, and local levels, but private interests are also demonstrating their advocacy. City and state parks, industrial areas, and both downtowns are targeted for connection to the trails, in a move similar to the

comprehensive transportation approach of the Hutchinson project. The Iowa system, however, is primarily composed of off-road trails, separating non-motor travel from vehicles in the interest of safety.

Safety first, of course, but there are other perks: off-road trails are "more aesthetically pleasing" than those located close to traffic, says Kevin Blanshan, senior director of transportation and data services with the Iowa Northland Regional Council of Governments (INRCOG). In addition, there is a significant economic impact from the trail development, including the appearance of bike shops in Cedar Falls and the interest of bicyclists from outside the area.

Those who frequently opt for alternative traveling see benefits when it is integrated into already-established transportation routes. In a letter to the *Iowa State Daily*, one reader states, "A sound bicycle policy . . . treats cyclists like other vehicles, and encourages all vehicles to share the road."

For more information about biking trails, specifically the Hutchinson project, contact John P. Rodeberg, 320-587-5151. ■■

The Ansborough Trail was built in conjunction with Ansborough Avenue's reconstruction in an effort to integrate alternative travel with motor transit.

Photos on this page courtesy of INRCOG.



The Cedar Prairie Trail in Cedar Falls winds through Iowa's colorful landscape while remaining close to Highway 58.

Travelers on the Sergeant Road Trail to Waterloo can enjoy Iowa's natural foliage.





Thinking about upgrading?

Wouldn't it be great if computers could just grow the necessary new components that operating systems like Windows 95 require to run well? That solution would take the hassle out of deciding whether to add more RAM (random access memory), upgrade the CPU (central processing unit) or other components, or just buy a completely new system. Pam McColley, CTRE's network administrator, offers readers her thoughts on computer upgrades.

IF YOU ARE CONSIDERING upgrading your computer, ask yourself the following questions:

- What is your budget? Is it very tight? (Upgrading your current computer system by adding another hard drive, more RAM, etc., *may* be less expensive than buying a whole new system.)
- What are your future software needs? Will you use more applications than you use now? How many applications would you like to have running at one time? Do you plan to upgrade your applications as quickly as their manufacturers upgrade them? (Each upgrade may easily require double or even triple the amount of hard drive space and significantly more RAM than the previous version.)
- Will you have more money to spend in the next year or so? (A partial upgrade now may get you by for a while.)
- How much of a computer upgrade do you need? (A significant upgrade may cost nearly as much as a new computer with the same features. To determine the extent of your needed upgrade, see "Putting it all together" later in this article.)
- Is a warranty important to you? (Warranties for upgrade components are generally for shorter periods of time than warranties for new computers.)
- Do you understand hardware jargon? Are you comfortable tinkering with the inside of your computer? (Some upgrades, like adding RAM, are fairly simple to perform even for technonovices. Others, like adding a second hard drive within the computer box, should be done by professionals, who, of course, will charge for their services.)

Every situation is unique, but by keeping the above questions in mind you can use the following basic guidelines when considering an upgrade.

For a *basic* computer system used primarily for word processing and small spreadsheets, I would suggest at least a 486DX2-66 processor, 16 megabytes (MB) of RAM, and 500 MB or more of hard drive (HD) space. Naturally these specifications, as well as the operating system (Windows, DOS, etc.), depend on your applications' minimum requirements, how important speed is to you, how much data you plan to store, how many applications you intend to run at once, and how much space they require. To decide if this basic configuration is adequate for you, consider the following issues.

Word processing and spreadsheets

If you are running only word processing software, the above configuration is probably adequate unless you work with and store many large document files or anticipate working with large files in the future. The above configuration may also be adequate for running spreadsheets. If you plan to run large spreadsheets, however, your machine will need more RAM to load them, possibly more HD space to store them, and a faster processor to make loading and manipulating them efficient.

Computer aided design

For running a CAD application, I would suggest getting a Pentium processor with as much speed as is time- and/or cost-effective for you. I also recommend at least 32 MB RAM and a one-gigabyte (GB) HD. Heavy graphics users should consider a Pentium Pro processor because it is specially designed for CAD and accounting applications. You will see a dramatic increase in speed for these situations, but other applications, such as word processing, may actually see a decrease in speed.

Graphics

If you use large graphics files, or if you have to wait a long time for the computer to draw the graphics on the screen, try upgrading to a fast and/or high memory video card. These cards can make working with graphics a pleasure. If you use the Internet or anticipate using it in the future, remember that the World Wide Web is graphics intensive; an upgraded video card may make your use of this resource more efficient and pleasant.

Putting it all together

The best rule of thumb is to make a list of all the applications you currently run plus those you want to run in the future. Collect information about their minimum requirements for HD, RAM, processor, and operating system. (This information is available in software catalogs and manuals.) Figure out if you want to upgrade your applications as new versions appear. As you go through the following steps,

remember that the minimum requirements will often increase with each new version.

First, decide if any application you plan to use requires you to upgrade your operating system (OS). Windows OSs are fast becoming the industry standard. Then check the processor and amount of RAM you'll need to support that OS.

To decide how much HD space you need, add up the minimum HD requirements for all the applications you'll be using. Don't forget to add the HD space required for the operating system. At least double the total if you will regularly get software upgrades. Estimate and add plenty of HD space for file storage.

Next compare the minimum requirements for the processor, its type and speed, to run your software packages and OS. You'll need a processor that meets the *highest* minimum standards for any one software package. Again, a processor adequate for your current software may be inconveniently slow when you get the next versions.

Then consider the minimum RAM required to run each application. If you will run more than one application at a time, add the RAM requirements together. Add your operating system's RAM requirements to the total.

Finally, check the minimum requirements and/or suggestions for video RAM.

Other items to keep in mind as you consider an upgrade are a CD-ROM drive and a fax modem.

CD-ROM drives allow you to install software easily (some new applications require a CD-ROM drive to install the software) and to access data (for example, census data to use with GIS applications) and graphics. A CD-ROM drive is often misunderstood in terms of the speed you may need. If you plan to use the CD-ROM drive mainly to install software, speed is not very important. If you plan to use the drive for accessing data or graphics regularly, then speed is very important. The cost difference between speeds is small compared to the potential time saved or the improved viewing smoothness of faster CD-ROM drives.

The question of adding a fax modem is fairly simple. Do you want to access the Internet or electronic bulletin boards (like CTRE's BBS) or to send or receive facsimile (fax) documents? If so, then you need a fax modem. The speed I recommend is 28.8 bauds per second (BPS). A slower modem may cost you more in long-distance telephone charges or services, and faster speeds have not



Installing more RAM is a simple procedure.



More complicated upgrades like adding new boards are best left to trained professionals.

been perfected yet. Even if you can connect at a faster rate, the clarity of the lines can be a problem, and you may have technical difficulties with some functions at that speed. However, it is becoming harder to find modems at 28.8.

You've calculated your minimum operating system, HD, RAM, and processor requirements, and you've decided what peripherals you need. Now you can start comparing the cost of buying and adding upgrades to your current system against the cost and convenience of buying a new computer that satisfies all your requirements. Weigh your budget, your future plans, and warranty issues and give yourself as much of a cushion above the minimum requirements as you can afford.

At this point a competent vendor can be invaluable in helping you analyze your particular situation. He or she can also tell you if a particular upgrade is even feasible—installing a new processor in your current computer, for example. Remember that with computers, a configuration that's simply adequate today is often soon grossly inadequate. My feeling is that it is cost effective in the long run to buy as much of a computer as you need and can afford so you won't have to upgrade too soon. ■■

Winter Training Expo
 October 8–9, 1997
 Scheman Building and
 Hilton Coliseum
 Ames, Iowa

Held in conjunction
 with the 8th Annual
Iowa Snow Plow Rodeo
 October 7, 1997
 Iowa State Center
 Parking Lot
 Ames, Iowa

This event is primarily for city (pop. 3,000-plus), county, and state administrators, supervisors, and operators involved in winter roadway maintenance. Law enforcement, emergency response, and airport maintenance personnel will also find it helpful.

Participants can attend the rodeo, the expo educational sessions, or both. Social events and special tours are also being planned.

Don't miss Iowa's Winter Training Expo— coming in October



WHERE CAN YOU GO to do the following?

- Learn about the latest and best equipment, materials, and techniques for keeping winter roads clean
- Swap winter safety strategies with city, county, and state personnel (administrators and equipment operators), as well as law enforcement and emergency responder staff
- Watch operators from all over Iowa demonstrate their driving prowess in the biggest rodeo east of the Rockies (snow plow "rodeo," that is)—or bring your own rig and compete yourself
- Rub elbows with manufacturers and suppliers of winter maintenance equipment, materials, and services, and participate in hands-on demos of their products
- Learn how to stay alert and effective when a long storm keeps you behind the plow for hours
- Be among the first to see the snow plow of the future, a truck rigged with state-of-the-art technology to help operators keep roads drier and safer

You'll do all these things and more at the Iowa Winter Training Expo.

On Tuesday, October 7, you can compete in the 8th Annual Iowa Snow Plow Rodeo, to be held in Ames for the first time.

Then on October 8 and 9 you can attend educational sessions on snow fence management, harnessing the power of salt, chemical management, anti-icing strategies, plowing and winging operations, roadway weather information systems, equipment *operator* maintenance, and much more! Between workshops, talk with vendors and check out their displays.

Participants may attend **either** the one-day snow rodeo or the two-day educational program—**or both**. Registration materials and more detailed information will be mailed in August, but mark your calendar now.

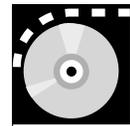
The expo is sponsored by the Iowa Department of Transportation, Iowa County Engineers Association, American Public Works Association, Iowa Secondary Road Maintenance Supervisors Association, Federal Highway Administration, and the Center for Transportation Research and Education (CTRE). ==

Name that tune

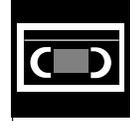
THE CITY OF AMES placed these signs along two main arteries to warn people that Hyland Avenue would be closed for the summer for construction. The signs are an example of good public relations with a dash of humor. ==



FOLLOWING IS A SAMPLING of new or popular materials available from the CTRE library. To obtain materials or a catalog of library materials, contact Stan Ring, library coordinator, Monday, Wednesday, and Friday mornings at 515-294-9481. Or use this page as an order form. Check the box next to the materials you want and return this form to the Center for Transportation Research and Education, ISU Research Park, 2625 N. Loop Drive, Suite 2100, Ames, Iowa 50010-8615. (Please limit your request to four items.)



library materials



Publications

Distributing State Road Use Tax Funds to Counties (Iowa DOT-HRB, HR-386, 1996) 75 pages	This report details an advisory group's proposed alternative approaches to distributing RUTF to counties. The university researchers studied these suggestions, and they present an approach based on six factors. Loan copy	Request #P1230	<input type="checkbox"/>
Bond Enhancement Techniques for PCC Whitetopping (Iowa DOT-HRB, HR-341, 1996) 42 pages	This project studied the effectiveness of various techniques to enhance bond strength between a new PCC overlay and an existing ACC pavement surface. Loan copy	Request #P1231	<input type="checkbox"/>
Traffic Calming in Practice (Landor Publishing, London, 1994) 199 pages	This English publication discusses various techniques for reducing the speed of traffic in residential areas. Numerous examples are presented. Loan copy	Request #P1235	<input type="checkbox"/>
The Traffic Safety Toolbox (ITE, 1993) 255 pages	This primer on traffic safety presents a compilation of information on subjects that provide ideas and concepts for effective traffic safety improvements. Loan copy	Request #P1236	<input type="checkbox"/>
Design and Safety of Pedestrian Facilities (ITE, 1995) 65 pages	This proposed ITE-recommended practice discusses guidelines for the design and safety of pedestrian facilities. Loan copy	Request #P1238	<input type="checkbox"/>
Performance of Concrete Pavements Containing Recycled Concrete Aggregate (USDOT-FHWA, RD-96-164, 1997) 296 pages	This report is based on research in four states and includes the performance of pavements that incorporate recycled concrete aggregates. Loan copy	Request #P1239	<input type="checkbox"/>

Videotapes

Highway Work Zone Safety (Iowa DOT, 1997)	These videotapes have been prepared by the Iowa DOT to heighten general awareness among workers of the dangers in highway work zones. Eleven tapes are planned for this award-winning series. The series includes tips for trainers. Loan copies	Request #V506	<input type="checkbox"/>
One Step from Death 11:00 minutes		Request #V507	<input type="checkbox"/>
Grading Safety 14:00 minutes		Request #V508	<input type="checkbox"/>
Plant Site Safety 10:20 minutes		Request #V509	<input type="checkbox"/>
Structures Safety 12:20 minutes		Request #V510	<input type="checkbox"/>
Traffic Control Safety 10:20 minutes			
Crack Sealing Flexible Asphalt Paving (USA-CRREL, 1990) 8:00 minutes	This video discusses the reasons for sealing cracks and the planning and practices used in operations. A how-to-do-it training video. Loan copy	Request #V503	<input type="checkbox"/>
Winter Driving (Summit Training Source, 1996) 12:00 minutes	This training video identifies safe driving skills. A facilitator's guide and employee handbook are provided. Loan copy	Request #V504	<input type="checkbox"/>
Walkable Communities: Designing for Pedestrians (Northwest T2 Center, 1997) 323:00 minutes	This four-volume set of videotapes covers lectures by Dan Burden in Seattle. Loan copy	Request #V513	<input type="checkbox"/>



Stan Ring, library coordinator

Stan says

CTRE now has FIVE CD-I players available for two-month loan periods, as well as two NEW training CDs on management:

CI4: Meetings, Meetings, Bloody Meetings

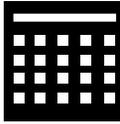
Discusses skills in conducting productive meetings that get you out of the meeting room and back to work. Each point is illustrated by a scene. A discussion guide is included.

CI5: Straight Talking: The Art of Assertiveness

Explains key principles of assertive behavior, as opposed to being aggressive or submissive. Each point is illustrated by a scene. A discussion guide is included.

Name (first/last) _____
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Please send me the *new, updated, 1998* catalog of all publications and audiovisual materials available from your office.



June 1997

24 Motor Grader Operator Training

July 1997

15 Motor Grader Operator Training
27-30 National LTAP Conference
29 Motor Grader Operator Training

August 1997

3-6 ITE National Conference
5 Motor Grader Operator Training
12 Motor Grader Operator Training
19 Motor Grader Operator Training
26 Motor Grader Operator Training
27-29 APWA Fall Conference

September 1997

13-17 APWA Congress
23 Management Seminar (in conjunction with Iowa Secondary Road Maintenance Supervisors Association Annual Conference)
24-25 Iowa Secondary Road Maintenance Supervisors Association Annual Conference

October 1997

7 8th Annual Iowa Snow Rodeo
8-9 Iowa Winter Training Expo

Location	Contact
Ottumwa	Sharon Prochnow, 515-294-3781
Davenport	Sharon Prochnow, 515-294-3781
Duluth, MN	Duane Smith, 515-294-8103
Cherokee	Sharon Prochnow, 515-294-3781
Boston	Duane Smith, 515-294-8103
New Hampton	Sharon Prochnow, 515-294-3781
Cedar Rapids	Sharon Prochnow, 515-294-3781
Red Oak	Sharon Prochnow, 515-294-3781
Cherokee	Sharon Prochnow, 515-294-3781
Lake Panorama	Jim Cable, 515-294-2862
Minneapolis	Duane Smith, 515-294-8103
Ames	Sharon Prochnow, 515-294-3781
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